

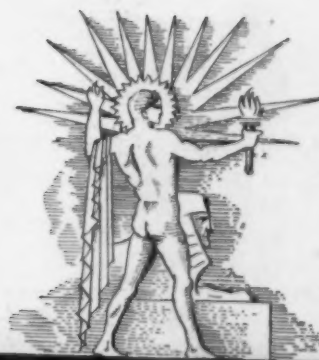
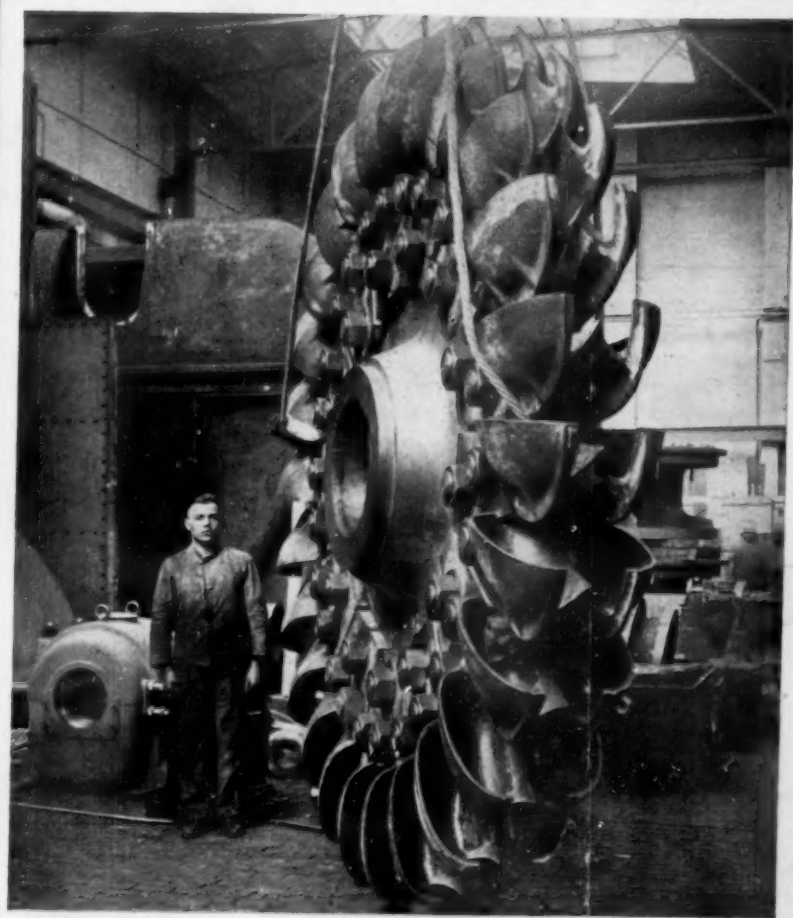
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SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE.



FEBRUARY 7, 1931

Bucketed Harvester of Power

See Page 89

A

SCIENCE SERVICE PUBLICATION

SCIENCE NEWS LETTER

Vol. XIX

No. 513

The Weekly  Current
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The Institution for the Popularization of Science organized under the auspices of the National Academy of Sciences, the National Research Council and the American Association for the Advancement of Science.

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DO YOU KNOW THAT

All known species of birds have been listed in a single set of volumes to be published by the Harvard University Press.

The invention of paper from fibrous matter suspended in water is credited to the Chinese at the time of the Christian era.

Migratory families, traveling about in wagons, automobiles, trains, or by hitchhiking, were investigated in Kansas in 1929, and it was found that 2,000 such families were given public aid that year.

Honeybees flying heavily loaded with nectar have been known to become exhausted and to fall into the water and drown.

Frozen meat is more tender and has better flavor if cooked while still frozen stiff, is the report of British Health officials.

There is an almost inexhaustible supply of bromine in sea water, but bromine is still obtained for industry from salt brine deposits.

In 1929 the United States still had some 190,000,000 acres of unreserved and unappropriated public land; most of this is not suited for farming.

Badgers have been making trouble for aviators in the west, by digging holes that make landing hazardous.

The Greek architect Vitruvius declared that columns at the corners of a temple should be made a fiftieth thicker in diameter, because the outer columns seem smaller than they really are.

A panel of expert translators who have special knowledge of one or more subjects is being made up by the Association of Special Libraries and Information Bureaus.

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Science Service presents over the radio, an address

HOW PAPER MONEY IS MANUFACTURED

By A. W. Hall, Director of the U. S. Bureau of Engraving and Printing
Friday, February 13, at 3:45 P. M., Eastern Standard Time

Over Stations of

The Columbia Broadcasting System

ELECTRICITY

Better Light for Less Power From New Illuminating Unit

Tubes Filled With Rare Gases Developed in Claude Laboratories Give Light at Voltages Used in the Home

THE DEVELOPMENT of a new type of electric illuminating unit which, it is said, uses only half the power required by present incandescent filament bulbs and gives a softer and more uniform light has been announced by Claude Neon Lights, Inc., of New York.

The new lighting unit is the result of refinement of the red, tube-like neon electric signs, which have come into wide use during the past few years, and brings to more complete development a previous invention of Georges Claude, famous French engineer and scientist who last year conducted notable experiments in Cuba to get power from temperature differences of sea water.

A very high voltage is needed to operate the red signs, but the new lighting units, radiating either incandescent white light or a light containing approximately the same wavelengths as that from the sun, can be used with ordinary house wiring or either 110 or 220 volts, alternating or direct current, officers of the Claude organization said. It is stated that these new low voltage units are ready for application in the industrial and commercial field and that tubes or lights for general household use will be manufactured soon.

Glass tubes, which can be made in any length from several inches to several feet, containing the rare gases of the atmosphere, helium, neon, argon, krypton and xenon, are the most conspicuous elements of the new unit.

The initial cost of the new lights will probably be higher than that of types now in use, officers of the company stated, but when the saving in power consumption is considered the cost over a considerable period of time is expected to be less than that of present electric illumination.

The new tubes distribute light evenly and have a soft, non-glaring quality, it is stated. It is possible to look directly into the exposed tubes for several minutes and turn immediately to read fine print, without undue eyestrain. They do not require heavy diffusing glass which

would greatly cut down their efficiency, and they give off much less heat than incandescent lamps.

Four years of laboratory research work and tests have yielded four new developments which make the new units possible. First, the correct mixtures of the rare gases of the atmosphere have been found. These gases, glowing under the action of the current passing through them, and not a metal heated to incandescence, produce the light.

A starting apparatus has been developed which will light the tube seven seconds after the switch is turned. This necessitated the perfection of a heating unit that automatically turns off after the tube is lighted. Electrodes for the conduction of low current and a ballast coil, which largely determines the power consumption and illuminating strength of the units, were designed. The starting apparatus and ballast coil are small and inconspicuous.

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CHEMISTRY

New Unit of Atom Needed by Scientists

SCIENTISTS are now on the hunt for a new basic unit weight of matter. Chemists have in the past used the atom of oxygen as the unit of atomic weight, calling it 16.

Dr. F. W. Aston of Trinity College, Cambridge, in a communication to scientists printed in *Nature*, has raised the point that since there are now three known varieties of oxygen, known as isotopes 16, 17 and 18, the average atomic weight of the element oxygen is about 1.25 parts in 10,000 greater than the customary 16 assumed in chemical books.

While chemists might get along with the present standard, Dr. Aston intimates, physicists who compare the weights of individual atoms by means of the mass-spectrograph with an accuracy of 1 in 10,000, need a new and more definite unit.

Among the possible units suggested are: The proton or positive nucleus of the hydrogen atom, the neutral hydrogen atom, one-quarter of the neutral helium atom, one-sixteenth of neutral oxygen atom 16. None of these proposed units is entirely free from objection.

Science News Letter, February 7, 1931

Elephants do not shed their tusks.



DAYLIGHT ILLUMINATION FROM A RARE GAS TUBE

An early industrial lighting unit of the new low voltage rare gas tube developed in the Claude Laboratories under the direction of Leo L. Beck.

METEOROLOGY

Canada's Winter Depends Upon India's Summer Weather

Air Pressure Above Normal in India Presages Moderate Cold for Canadian Prairies, Studies Since 1875 Indicate

A MODERATE winter on the Canadian prairies is the indication of certain world weather correlation formulas applied by Dr. Charles F. Brooks and Earl B. Shaw of Clark University, in the current *Bulletin of the American Meteorological Society*.

This computation, applying to the current winter taken as a whole, including the current month of February, is based on weather conditions of India and Argentina during last summer.

When India's pressure is above normal for the months from January to October, the following winter in Canada and the north central part of the United States is likely to be above normal in temperature as indicated by formulas devised by Fred Groissmayr of Passau, Germany, Dr. Brooks and Mr. Shaw are convinced.

During the months of 1930 before October, India, as represented by Nagpur, has had the high pressure which usually heralds a mild winter for Canada on the other side of the ocean and the globe. And although the other weather factors in India, usually associated with a mild winter in Canada, do not entirely substantiate this indication, the evidence is considered sufficiently strong to form the basis for a reasonable expectation that this winter will not be so cold as the average.

Temperatures in Central Argentina are also thought to have an influence on Canadian winters, and reports from South America add strength to the prophecy of a moderate winter. Mild temperature in Central Argentina is usually followed by a moderate winter in central North America and this year Central Argentine temperature, represented by Goya, was above normal for the months through July.

Investigations of the relationship between Canadian winters and weather conditions in distant parts of the world take into account meteorological records since 1875. During the period from 1875 to 1920, the indications for a mild winter in 13 instances have been as favorable as they now are and in

each instance a moderate or mild winter ensued.

"While present calculations should hardly justify us in counting on a moderate winter, 1930-31, at Winnipeg as a certainty, we can say that all previous indications as strong as those for the present winter being above normal have been correct," Dr. Brooks and Mr. Shaw conclude.

Prediction Holding True

Weather reports received by the U. S. Weather Bureau from Winnipeg for the months of December and January show that the Canadian winter thus far has been above normal in accordance with calculations based on weather in India and Argentina. Although the monthly averages have not yet been computed, government meteorologists stated that daily weather reports for this January ranged mostly between zero and 32 degrees Fahrenheit instead of between zero and minus ten degrees as usual in January.

Science News Letter, February 7, 1931

ELECTRICITY—PHOTOGRAPHY

First Stroboscopic Movies "Still" Whirling Motors

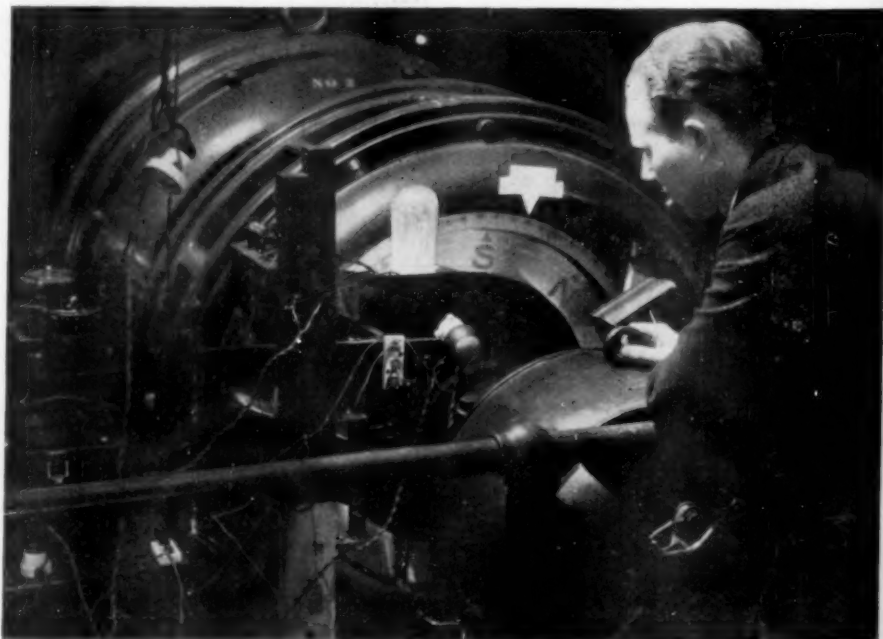
AN APPARATUS that will instantaneously "stop" a whirling electric motor for ten one-millionths of a second, long enough to take a picture of it, and then start the motor just as quickly has been developed in the laboratories of the Massachusetts Institute of Technology.

The motor is not actually halted in its mad rotating at a circumferential speed equal to that of a wheel traveling over the ground at 95 miles per hour, but it certainly does look as though it were standing still.

The new instrument is an improvement of the stroboscope, a type of apparatus that has long been used to study motion. Stroboscopic motion pictures, believed to be the first ever taken, have been made possible by the instrument. They were shown before the meeting of the American Institute of Electrical Engineers in New York last week.

The unique feature of the new stroboscope is the electrical circuit which causes a condenser to discharge periodically through a thyratron mercury arc tube. An intense blue actinic light of extremely short duration, precisely timed to correspond with the speed of the machine, is produced and makes possible the use of the stroboscope for photographic as well as visual observation.

Science News Letter, February 7, 1931



WHIRLING MOTOR "STANDS STILL" FOR ITS PICTURE

ASTRONOMY

February Evening Skies

Mars With Its "Canal" Markings and Giant Jupiter are The Only Planets Visible in the Evenings This Month

By JAMES STOKLEY

TO MANY people the most familiar planet, except, of course, the earth itself, is Mars. Not because it is so brilliant, for Venus frequently surpasses it in brightness. Nor is it because of the fact that it is closest to us. Again, Venus approaches closer still. Mars is well known because of the great speculation that it has engendered. The "canals" of Mars—who has not heard of them?

This month Mars is well placed for viewing. High in the eastern sky this evening, if it is clear, Mars can be seen. Its steady planetary light distinguishes it from the neighborly stars, but its ruddy color affords the chief means of identification. Above it and even brighter, can be seen Jupiter, another member of the planetary family, but there should be no trouble in telling it from Mars.

To the naked eye, Mars does not seem especially striking, and to the layman, usually, the first view through a telescope is rather disappointing. But with a fairly large telescope, details are seen which can only occasionally and then very poorly, be glimpsed with a smaller instrument. Even with a large telescope these details are not at all clear. With such an instrument, Mars is seen scarcely better than is the moon with the naked eye. But these markings have been the cause of the vast amount of speculation concerning this interesting planet. They are the so-called "canals."

It is now nearly a half century since the Italian astronomer, Schiaparelli, first observed these markings with what was, even then, a rather small telescope. To them he gave the name "canali." When his writings were translated into English, they were rendered "canals," instead of "channels," which would have been more correct. This mistranslation has been the cause of much of the interest in Mars, for "canal" connotes an artificial origin, while a channel may or may not be the work of man.

The late Prof. Percival Lowell,

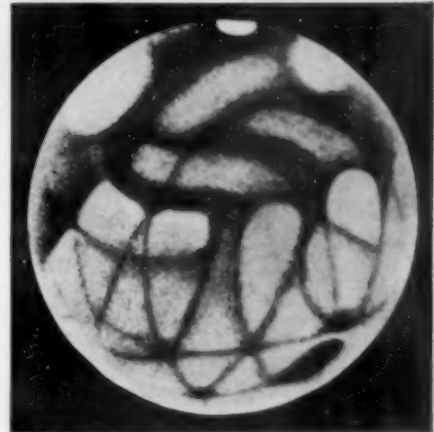
founder of the Lowell Observatory, in Arizona, did much to popularize Mars, for it was he who took the so-called canals as evidence for the existence there of intelligent life. Prof. Lowell was probably the greatest of the modern planetary observers. He was famous for his researches even before the discovery of the trans-Neptunian planet, Pluto, close to the place he predicted, was announced last year. Also, the observatory he founded is without doubt the chief center of planetary research.

But Prof. Lowell had private means. His observatory was entirely his own, and he was not liable to be called to account by any higher authority. Therefore he went, perhaps, a little farther than any other astronomer of the time would care to go. They would be content to make their observations and publish them, but would be very cautious about speculating as to their meaning.

"Wildest Speculation"

Prof. Lowell, however, indulged in what many thought to be the wildest speculation. In his books he tells us that he observed these markings for years, and that they went straight across the face of the planet, along that shortest distance between two points on a sphere—a great circle. This, he argued, would probably not be the case if they were natural; but if an intelligent being were planning a series of water courses on such a planet, he would follow just such courses. He supported this by other arguments, and thus built up an elaborate and ingenious theory. It is still a cause of controversy, but whether true or not, one can have nothing but admiration for its author. And though few astronomers, with the exception of Prof. Lowell's own successors at his observatory, are willing to accept it fully, recent years have seen a tendency towards accepting some of the parts of it.

For instance, it was stated, and on good authority, for many years that the "canals" were mere optical illusions. The eye has a tendency, it was said, to connect together promiscuous points and marks, to form lines. But as other



"CANALS" OF MARS

As drawn by an astronomer who was a staunch believer in the canal theory.

observers saw them, and later, as they were photographed rather indistinctly, those who had completely opposed Lowell began to admit that there might be something of the kind on Mars. Today, it seems to be the consensus of opinion among astronomers that there are some kind of long, straight marks covering the surface of the planet. But whether they are the detailed network of fine lines that Lowell described, is more in question. And as for their affording evidence of the existence of intelligent life on Mars, few are willing to express their belief in this theory. And one present-day authority still holds out against them. Dr. E. M. Antoniadi, of the Meudon Observatory in France, and the leading European planetary observer, wrote a book on the planet which was published only a few months ago. One chapter in it is entitled, "The Illusion of Canals". In it he states: "No one has ever seen a true canal on Mars."

So the argument is still unsettled. Probably it will continue a subject for controversy until that distant day when planetary travel is possible, and explorers can actually go to Mars and find out. Larger telescopes will only help slightly. If there were no atmosphere, the larger telescopes became, the finer detail on Mars they could show. But unfortunately, or perhaps fortunately, we live on a planet surrounded by a layer of air which is always permeated by currents of different density which refract light in varying amounts.

Therefore, as a telescope becomes greater, the wider is the column of air through which the light has to travel to get to it. Thus, there is more opportunity for air currents to distort the image. Experienced planetary observers often find it necessary to reduce the size of their lenses by placing a diaphragm, or a dark screen with a hole in the center, over them. Consequently, it cannot be expected that the 200-inch telescope now being designed for the California Institute of Technology will answer the puzzles about Mars. The chief advantage of that huge instrument over smaller ones will be in gathering more light from objects very faint and very distant, but not requiring very great resolution of fine detail.

The other main planetary attraction of the February skies is Jupiter, shining almost overhead and even brighter than Mars. These two planets are very different. Mars is a little smaller than the earth in size, 4,216 miles in diameter as compared with ours of 7,918 miles. It revolves on its axis

once in about $24\frac{1}{2}$ hours, so that its day is slightly longer than ours. It is somewhat more than one and a half times as far from the sun as the earth (141,500,000 miles as compared with 92,900,000) and makes a trip around its orbit in 687 days (a little less than a year and eleven months). It has two moons, both very small.

Jupiter, on the other hand, is the giant of the planets. So large is it that if it were a hollow shell it would be able to hold all the other planets. Its mean diameter is 86,728 miles, but its day, the time for revolution on its axis, is about 9 hours and 55 minutes. It takes nearly twelve of our years, or 4,333 days, to make one revolution in its orbit. But so huge is this orbit that it travels along at the rather respectable clip of eight miles a second. Its distance from the sun is about five and one-fifth times that of the earth, or 483,300,000 miles. In the matter of moons, it is better provided than any other planet except Saturn. Jupiter can boast, though it never does, of nine satellites.

Four of these are much brighter than the rest. These were the first objects discovered by Galileo in 1610 when he, for the first time in history, looked at the heavens through a telescope. In diameter, these four vary from 2,050 miles to 3,560 miles, so they are about as large as the planet Mercury, with its 3,009 miles. The other five are very small, so their size cannot be definitely determined. The smallest is only a few miles, and the largest may be of the order of a hundred miles. Probably there are other tiny satellites farther out that may be discovered with the larger instruments of the future.

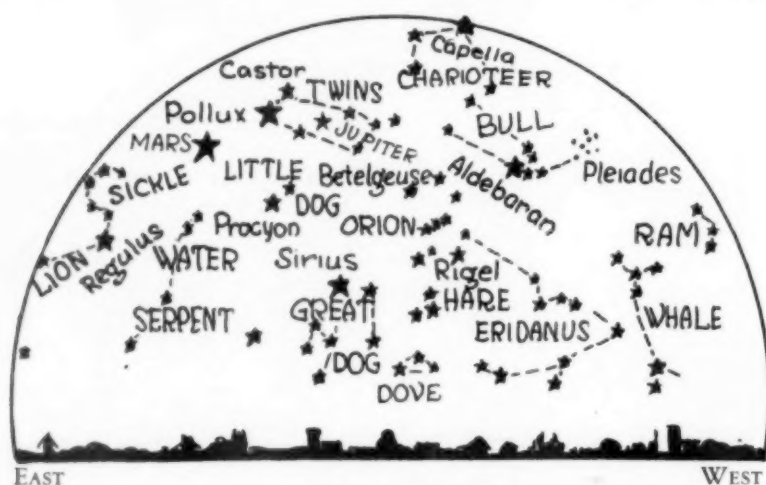
Features of Jupiter

The chief feature of Jupiter, seen through a telescope, is its system of belts, which cross its disc. Also, the telescope shows that it has an appreciable bulge around the equator. The cause of this bulge is to be found in its rapid rotation, tending to throw the material along the equator out from the center. The earth, too, has an equatorial bulge, but not nearly so marked, because of our slower speed of rotation, and also because of our smaller size.

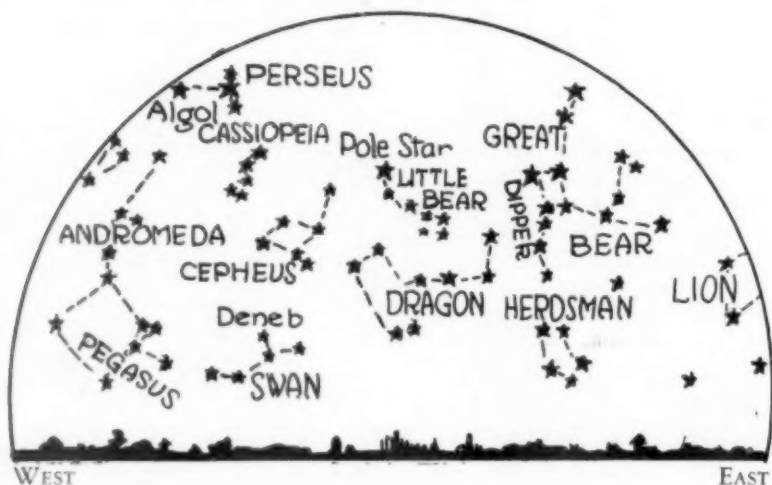
These are the only naked-eye planets visible this month in the evening sky. Among the stars, Orion is still the most prominent feature. Shining in the south, the three stars forming the warrior's belt afford easy means of identification. Above, is the reddish star Betelgeuse, below, Rigel, and above and to the right, Bellatrix. Capella, marking Auriga, the charioteer, is almost overhead. Sirius, the dog-star, in Canis Major, the great dog, is conspicuous in the southeast, and to its left is Procyon, in Canis Minor, the little dog, only slightly inferior in brightness. Pollux, the brighter of the twins, Gemini, is between Procyon and Capella, along with his brother, Castor.

Low in the northeast is now appearing another familiar group, the Sickle, of Leo, the lion. Regulus marks the end of the handle, at the bottom. Over in the west, the four stars, marking the "Great Square in Pegasus," is setting. The Great Dipper, with its pointers indicating the Pole star, is in the northeast, and above and to the right of the Pole star is the W-shaped group marking Cassiopeia. All of these are familiar groups, and one who wants to know the stars should be able to recognize them. Then, as you see them, night after night, they will seem like old friends.

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SOUTHERN SKIES



NORTHERN SKIES

PALEONTOLOGY

Record Size Mastodon Found By Indiana Farmer Boy

Lad's Stubbing Toe Over Eight Pound Molar Tooth Leads To Recovery of Bones of Animal with 12-Foot Tusks

ONE OF the largest mastodons ever discovered in America has been found in a dried-up pond on the Charles Feldheiser farm, a mile south of Cromwell, Ind., by a 10-year-old youngster who was hunting skunk holes.

The boy was Donovan Harper. He stubbed his toe over a smooth object protruding from the black mud. Investigating it, he yanked out a molar tooth weighing $8\frac{1}{4}$ pounds.

Elated by his find the lad lugged the treasure home. His story led Mr. Feldheiser and others to start digging on the spot where the huge tooth was found. An enormous jawbone soon was uncovered.

Scientist Sought

One of the neighbors knew a bit about geology and he advised Mr. Feldheiser to communicate with Dr. C. J. Fish, director of the Buffalo Museum of Science. Dr. Fish, accompanied by Watts Richmond, a millionaire sportsman of Buffalo, lost no time in visiting the Feldheiser farm.

The Indiana farmer had wisely refrained from further digging into the mastodon "pay dirt." What Dr. Fish and Mr. Richmond saw, however, induced them at once to lease the site of the mastodon graveyard. A few days later the Richmond Expedition of the Buffalo Museum of Science, headed by Dr. John T. Sanford, curator of geology and paleontology of the museum, reached the farm and started excavation operations.

The first act of the scientists after establishing themselves on the Feldheiser farm was to have a wooden shed erected over the spot where the mastodon remains rested, to protect the bones from the weather.

Armed with hand trowels, they began a long and slow task of removing a foot of muck and three or four feet of clay from the big beast's remains. The unusually large proportions of the mastodon were realized when the first tusk unearthed measured 12 feet 6 inches in length.

"This is one of the largest, if not

the largest, mastodon found," Dr. Sanford stated. He estimates that the monster probably lived about 10,000 years ago in the post-glacial age.

As the soil was thrown aside handful by handful most of the parts of the giant skeleton were disclosed. The pelvis measured 5.3 feet across. Ribs were 4.4 feet long. The lower jaw was 3.2 feet long. The measurements of the humerus, femur and ulna respectively were 3 feet, 3.6 feet and 2.2 feet. Six articulated lumbar vertebrae were 1.8 feet long.

In the belief that the dried up old sink hole may be a regular mastodon cemetery, the Richmond expedition will conduct extensive excavations there this spring.

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ASTRONOMY

Tiny Planet Has Come Closest to Earth

THOUGH Jupiter, largest of all the planets, and Mars, famous planet of controversy, are now conspicuous in the night sky, astronomers at present are more concerned over a tiny planetary body only a few miles in diameter and so faint that it cannot be seen at all without a telescope. This is the asteroid Eros, now closer than it has ever been since its discovery in 1898, and closer than any other permanent celestial object, except the moon. On Friday, January 30, its distance was only 16,200,000 miles.

On the average, the moon is at a distance of 238,840 miles. Venus, one of our two next-door neighbors, can come as close as 26,000,000 miles. Mars, our neighbor on the other side, at rare intervals approaches to a minimum distance of 34,600,000 miles, but at present, as it shies with its ruddy light in the eastern evening sky, it is much farther. Jupiter, the brilliant planet seen these evenings high in the east above Mars, is now almost 400,000,000 miles away.



HUGE PREHISTORIC TUSKS

In the earth from which they were uncovered by the Richmond expedition of the Buffalo Museum of Science.

Eros is one of the large family of some 1,500 asteroids, or small planets, that generally travel in the space between Mars and Jupiter. Its orbit is considerably stretched out from the usual nearly circular shape for the larger planets. So elliptical is this orbit that at one point it comes within 13,840,000 miles of the earth's path. It seldom happens that the earth and Eros are in the adjacent parts of their orbits at the same time, but now that rare event has been realized.

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PSYCHOLOGY

Student's Attitude Important to Success

PREPARATION, study habits, intelligence, and evaluative and persevering attitude—and the greatest of these is the attitude. These, Dr. M. E. Herriott, psychologist in the public schools in Los Angeles, calls the five major factors necessary for scholastic success.

He discussed them in a recent report to the Western Psychological Association, deploring the fact that so little attention has been given by psychologists and educators to the attitudes of students.

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ORNITHOLOGY

**Raven Flies Upside Down
"Showing Off" Before Mate**

A BOY aviator going into loops, barrel rolls, Immelman turns and other sky-acrobatics just because he knows his best girl is watching him from the landing field is only following a fashion set by the birds who taught men to fly in the first place.

Sky-pranking by birds engaged in courtship is not at all an uncommon thing. They will even fly upside down. In the British scientific journal, *Nature*, Sydney Evershed tells of a raven he saw doing just that stunt, evidently to impress or please his mate.

He writes: "The two birds were flying close alongside each other, as is the habit of ravens. As they were passing by, the one nearer to me suddenly, and without any warning action, rolled over sideways and after falling in a confused fashion ended on his back, some five or six feet below his mate. In this position, and without losing horizontal speed, he continued flying; or to describe more precisely what I saw, he remained on his back, flapped his wings, and traveled along in what appeared to be level flight..."

"After flying upside down for a considerable distance, the raven rolled over again and got himself right side up..."

Science News Letter, February 7, 1931

MEDICINE

**Man Expected to Die
Saved by Hormone**

CORTIN, the new hormone extract prepared in a Buffalo laboratory, has kept a man suffering from once-hopeless Addison's disease alive for over six months.

"When first treated this patient was not expected to live," stated Prof. Frank A. Hartman and Dr. Katherine A. Brownell who developed the hormone extract and called it cortin. "Positive proof that the extract keeps him alive has been shown by four relapses which have occurred due to the reduction of extract. A few hours after increasing the extract, following a relapse, improvement is evident and in two or three days recovery is complete."

The extract contains the vital hormone of the cortex of the adrenal glands. When this part of the glands is injured or destroyed, death follows.

Addison's disease, which is caused by destruction of this vital adrenal cortex, has hitherto always been fatal.

Early efforts to study cortical extracts were blocked because it was impossible to get an extract free from epinephrin, the hormone of the medulla of the gland. In 1927 Prof. Hartman and associates were successful in preparing a cortical extract almost entirely free from epinephrin. Last year they developed a method of preparing a concentrated extract.

Other scientists, however, had been working on the same problem at other laboratories. In March, before the Buffalo scientists had perfected their last method, Dr. W. W. Swingle of Princeton University and Dr. J. J. Pfiffner of the laboratory of the Long Island Biological Association announced a successful method of preparing a similar extract. This extract has been used at the Mayo Clinic by Drs. Leonard G. Rowntree and C. H. Greene, who recently reported that they were successfully treating cases of Addison's disease with it.

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PSYCHOLOGY

**Death Sentences Averted
By Psychology Tests**

HOW a psychological examination saved two young prisoners from the death penalty in Georgia has been reported by a University of Georgia professor to the American Association for the Advancement of Science.

The professor, A. S. Edwards, declared that so far as he knows the case is without precedent. A psychologist has no standing, as such, in the courts of Georgia. But this particular report has been accepted by the Prison Commission, and the Governor ordered the death sentence commuted to life imprisonment.

The prisoners, brothers eighteen and sixteen years old, were convicted of murdering a negro and his wife and were to die in October. Professor Edwards, looking at the case as a psychologist, reported that the two were only nine years old in mentality. Various relatives with whom they associated were insane. In their home they were surrounded by conditions of violence, immoral relationships, bootlegging, and other influences, which led the psychologist to declare that they "did not have fair chances to develop into law-abiding citizens."

Science News Letter, February 7, 1931

IN SCIENCE

ANTHROPOLOGY

**Caveman Magician's Art
Described by Breuil**

RESULTS of his study of three rock engravings in the Trois-Frères Cavern in central France have been announced by Abbé Breuil, noted authority on the art of prehistoric man.

There are 100 engravings on the walls in this set of caverns. The caves open one into another, leading into deepest darkness far underground. Some of the pictures were scratched and carved by the old artists and then lined in black to bring them into higher relief.

The three pictures especially examined are in a row. First comes a reindeer with front limbs ending in human hands. Next in line is a creature with a bison's head, a goat's loins, and human legs. This being looks, as if in fright, at the third which is also half man, half beast. This creature has a bison's head and fur set on a man's shoulders, and the body has a long mule-like tail. With such art, the sorcerers of ancient times wrought magic, particularly to aid hunters in the chase, it is supposed.

Science News Letter, February 7, 1931

ZOOLOGY

**Desert Mice Less Thirsty
Than Other Wild Mice**

THE WILD mice of deserts have learned to get along on less water than their relatives of moister regions. That, at least, is the indication of a discovery made by Dr. F. B. Sumner of the Scripps Institution of Oceanography and reported in the 1930 Yearbook of the Carnegie Institution of Washington, which has just been issued.

He found that the water requirement, per unit of body weight, of desert-dwelling varieties of deer-mice is less than that of other varieties within the same genus that have a wider distribution, living in humid as well as arid habitats. The differences, which have been traced for several varieties, are hereditary.

Science News Letter, February 7, 1931

SCIENCE FIELDS

ARCHAEOLOGY

Egyptian Tomb Discovery Important to Science

THE TOMB of an ancient Queen of Egypt, which has now been discovered in the Ra Ouer tomb enclosure close by the Egyptian Sphinx, is a find of more than ordinary importance, Prof. James H. Breasted, noted Egyptologist, of the Oriental Institute, considers.

The discovery, reported to include the sarcophagus of the queen and royal household furnishings such as gold toilet articles, alabaster statuettes, a bed and other furniture, brings a group of valuable new materials to light, Prof. Breasted said. Besides the value of the discoveries themselves, the Ra Ouer tomb excavations are "of more than ordinary importance, marking the beginning of native Egyptian participation in archaeological research," he added.

Science News Letter, February 7, 1931

ENGINEERING

Engineers Question Manhattan Airship Mast

THE possibility of using the tallest of New York's buildings now under construction as an airship mooring mast is questioned in an editorial in the current issue of the *Engineering News-Record*, a leading civil engineering weekly magazine.

"Current sketches depicting the city of the future reveal the remarkable virility of the contemporary imagination," states the editorial. "In these drawings no limit is placed on the height or bulk of the buildings, and the airplanes and airships cruise in and out among the spires, landing in the streets or tying up to a convenient pinnacle. Subconsciously we want to believe in these pictures, and every opportunity to nurture our desire is seized upon.

"As a result, when the owners of a great building, like the Empire State Building in New York, top out their magnificent structure with a steel cage 200 feet tall and call it a mooring mast for airships, the idea falls on fertile soil.

"Apparently it is true that the base and main shaft of the mast are designed not alone for the expected wind load but for an extra horizontal load of 100,000 lb., which serves the purpose of lending credence to the airship-mooring claim. But it is also true that the top 25 ft. of the mast, where all of the mechanism for airship mooring would have to be installed, is a simple dome framework of radial roof trusses, incapable of anchoring a large dirigible. Unless present methods of airship handling are changed radically, there is little prospect that the elevators of the Empire State Building will be crowded with returning air voyagers."

Science News Letter, February 7, 1931

GEOLOGY

Ice-Age History Shows Four Cycles of Glaciers

THE glacial age, which we often speak of as though it were the oncoming of a single huge sheet of ice that sat on the American landscape for half a million years and then went away, was really a much more complicated affair. Dean George F. Kay of the University of Iowa divides the whole Ice Age, or Pleistocene period, into four chapters which he calls epochs, subdivided into shorter time units which he calls ages.

The whole epic of the Ice Age, Dean Kay said, can be read best on the broad prairies of Iowa, where he has worked for many years. Iowa and the adjoining states have furnished the names for the ages of drift or glaciation, from Nebraskan, the oldest, through Kansan, Illinoian, Iowan to Wisconsin, the most recent. Dean Kay's new names for his epochs are taken from the localities where each can be best studied. He calls them Grandian, Ottumwan, Centurian and Eldoran.

The time during which each succeeding sheet of ice covered the upper Mississippi valley seems to have been brief as compared to the long ice-free periods in between. Dean Kay estimated the total duration of glacial time in Iowa at a minimum of 30,000 years, and the total of all the interglacial ages at 675,000 years; a grand total for the whole Pleistocene, therefore, of about 700,000 years. The time that has elapsed since the last of the ice melted from the Iowa landscape he estimated at about 25,000 years.

Science News Letter, February 7, 1931

ENGINEERING

Little Waterwheel Does Big Power Job

See Front Cover

FORTUNATE are those countries which have small rivers falling rapidly, rather than huge slow moving streams. Electricity can be generated for these nations easily and cheaply.

To make electricity for Korea from the 2,000-foot fall of a mountain stream will be the life work of the Voith impulse water wheel shown on the front cover. Though its greatest diameter is just a little more than eleven feet and it weighs only eleven and a half tons; when turning at 360 revolutions per minute this simple wheel of steel develops 50,000 horsepower.

To produce 57,000 horsepower in this country at Spier Falls on the Hudson river a huge, slow turning water turbine, which weighs nearly ten times as much as the simple little Voith wheel, is required. It turns at 81.8 revolutions per minute under a head of 81 feet.

In only a few countries are there streams that fall far enough and rapidly enough for driving impulse turbines. Norway, Sweden and Switzerland have harnessed their falling waters to produce power in this manner and are noted for the quantity of electricity they use. Japan, too, is progressing in this respect.

At Lac Fully in Switzerland there is a hydro-electric power plant which operates under a head of 5,412 feet, more than a mile.

Science News Letter, February 7, 1931

GENERAL SCIENCE

Women Scientists Asked To Use Maiden Names

A PLEA that women biologists, when they marry, always continue to use their maiden names upon scientific publications has been made by Dr. T. D. A. Cockerell of the University of Colorado.

The increasing importance of the scientific work of women and the confusion that results from scientific references to the work of the same woman under two names, were advanced by Dr. Cockerell as reasons for his suggestions.

It would be possible for the woman scientist, if she wished, to add the married name: "By Mary Smith (Mrs. William Jones)."

Science News Letter, February 7, 1931

MEDICINE

Scientific Attack Launched Upon Drug Addiction

Non-Addicting Substitutes for Habit Forming Drugs Sought by National Research Council Committee

A FUNDAMENTAL scientific attack upon drug addiction has been launched and under way for the past two years, it became known when Dr. William Charles White, chairman of the National Research Council's committee, summarized the progress so far and the promises of future accomplishment.

Instead of treating the unfortunates who have become addicts to morphine or other habit-forming preparations, the groups of scientists working on this problem have begun with a thorough investigation of the chemical, biological and medical phases of the problem.

First, the committee is attempting to replace habit forming drugs with drugs lacking addiction properties. Morphine, for instance, is strongly addicting, while codeine, which causes few addicts, can replace many uses of morphine if used in larger doses. Marked progress had been made in recent years in the replacement of cocaine by safe drugs in practically all its uses except application for surface anesthesia. This gave the committee hope that substitutes for other habit forming drugs could be found and the national and international control of the manufacture, handling and sale of narcotics made easier.

With the cooperation of the American Medical Association, the committee plans to furnish physicians with information on the latest discoveries of how non-habit forming drugs can be substituted for those that are likely to cause addicts.

Laboratories Established

To discover narcotic substitutes two research laboratories were established, one at the University of Virginia for chemical analysis and synthesis of alkaloid substances and the other at the University of Michigan for the biological testing of the narcotics and their substitutes.

The National Research Council committee has also worked closely with the U. S. Public Health Service and the Treasury Department Narcotic Bureau.

The funds for the work have been provided by the Bureau of Social Hygiene, Inc., of New York City, of which Lawrence B. Dunham is director.

Because few American chemists had worked on alkaloid chemistry in the past twenty-five years, it was necessary to import chemists from Europe for the staff of the University of Virginia laboratory, which has been directed by Dr. L. F. Small, an American who had spent two years in narcotic research in Europe. Dr. Small and two colleagues, Dr. Erich Mosetting and Dr. Alfred Burger from the laboratory of Prof. Ernest Späth in Vienna, are now training American chemists to carry on this work. They have made thirty compounds for testing by the University of Michigan laboratory in charge of Prof.

METEOROLOGY

January Drought Threatens Crops in Many States

THE United States is in the grip of another drought, no less severe than last summer's, though people are not now suffering from uncomfortable heat. Abnormally dry January weather following the record-breaking drought of 1930 has depleted the subsoil moisture over large areas from the central Mississippi Valley eastward to the point that even a moderate deficiency of rainfall at the beginning of the active growing season would quickly injure crops, J. B. Kincer, chief of the U. S. Weather Bureau, told Science Service.

Heavy rains are badly needed in Missouri, Illinois, Indiana, Ohio, Kentucky, the Virginias, Maryland, Pennsylvania and New Jersey to replenish subsoil moisture, reports from these regions indicate.

Moisture at the surface of the soil is still sufficient for present needs in most places, but unless the deeper soil is sup-

plied before spring, even a slight drought would cause damage.

Members of the National Research Council's drug addiction committee include: Dr. William Charles White of the National Institute of Health, chairman; Dr. C. S. Hudson of the U. S. Bureau of Standards; Dr. F. B. LaForge of the U. S. Department of Agriculture; Dr. Walter Treadway of the U. S. Public Health Service; Dr. Carl Voegtlin of the National Institute of Health; Dr. Torald Sollmann of Western Reserve University School of Medicine; Dr. Reid Hunt of Harvard University School of Medicine; and H. J. Anslinger, U. S. Commissioner of Narcotics.

Science News Letter, February 7, 1931

There is less oxygen in the water of the Pacific Ocean than there is in Atlantic Ocean water. There is more oxygen in the water of great depths of both oceans than there is in water from moderate depths.

These are among the discoveries made by Dr. Erik G. Moberg of the Scripps Institution of Oceanography. Dr. Moberg found the greatest oxygen content in Pacific Ocean water at the surface. Here the water was nearly saturated with oxygen.

plied before spring, even a slight drought would cause damage.

"Winter wheat is beginning to need moisture rather generally throughout the Ohio Valley, with the ground now bare of snow. Conditions are still reported as fair to good but there was a deterioration in some parts," Mr. Kincer stated.

"The absence of snow in central Rocky Mountain regions was very unfavorable to winter grains, especially in Wyoming where winds were detrimental. Winter grains are doing well in the southwest but moisture is needed in the middle Atlantic sections."

This critical condition does not prevail, however, in Arkansas and other southern states which suffered acutely from the drought last summer, because of the heavy spring rains which preceded the dry weather and left the subsoil supplied with water.

Science News Letter, February 7, 1931

PSYCHOLOGY

The Psychology of Adolescence

"A Classic of Science"

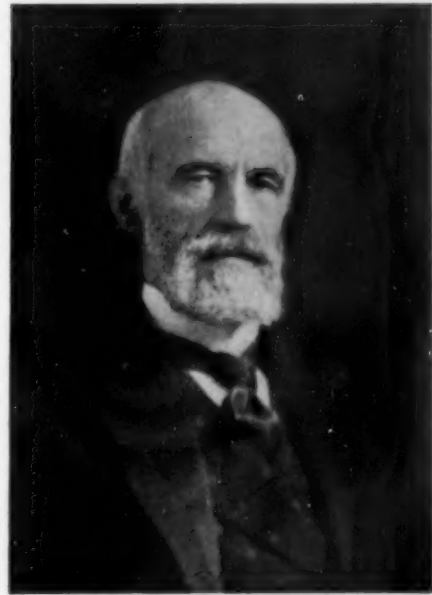
A Friend of Youth Interprets the Storm and Stress Age

ADOLESCENCE, Its Psychology and Its Relations to Physiology, Anthropology, Sociology, Sex, Crime, Religion and Education. By G. Stanley Hall. New York, 1904.

ADOLESCENCE is a new birth, for the higher and more completely human traits are now born. The qualities of body and soul that now emerge are far newer. The child comes from and harks back to a remoter past; the adolescent is neo-atavistic, and in him the later acquisitions of the race slowly become prepotent. Development is less gradual and more saltatory, suggestive of some ancient period of storm and stress when old moorings were broken and a higher level attained. The annual rate of growth in height, weight, and strength is increased and often doubled, and even more. Important functions previously non-existent arise. Growth of parts and organs loses its former proportions, some permanently and some for a season. Some of these are still growing in old age and others are soon arrested and atrophy. The old moduli of dimensions become obsolete and old harmonies are broken. The range of individual differences and average errors in all physical measurements and all psychic tests increases. Some linger long in the childish stage and advance late or slowly, while others push on with a sudden outburst of impulsion to early maturity. Bones and muscles lead all other tissues, as if they vied with each other, and there is frequent flabbiness or tension as one or the

other leads. Nature arms youth for conflict with all the resources at her command—speed, power of shoulder, biceps, back, leg, jaw,—strengthens and enlarges skull, thorax, hips, makes man aggressive and prepares woman's frame for maternity. The power of the diseases peculiar to childhood abates, and liability to the far more diseases of maturity begins, so that with liability to both it is not strange that the dawn of the ephebic day is marked at the same time by increased morbidity but diminished rates of mortality. Some disorders of arrest and defect as well as of excessive unfoldment in some function, part, or organ may now, after long study and controversy, be said to be established as peculiar to this period, and diseases that are distinctly school- and city-bred abound, with apparently increasing frequency. The momentum of heredity often seems insufficient to enable the child to achieve this great revolution and come to complete maturity, so that every step of the upward way is strewn with wreckage of body, mind, and morals. There is not only arrest, but perversion, at every stage, and hoodlumism, juvenile crime, and secret vice seem not only increasing, but develop in earlier years in every civilized land. Modern life is hard, and in many respects increasingly so, on youth. Home, school, church, fail to recognize its nature and needs and, perhaps most of all, its perils. The cohesions between the elements of personality are loosened by the disparities of both somatic and psychic development, and if there is arrest at any stage or in any part before the higher unity is achieved there is almost sure to be degeneration and reunion on a lower level than before. One of the gravest dangers is the persistent ignoring by feminists of the prime importance of establishing normal periodicity in girls, to the needs of which everything else should for a few years be secondary.

The functions of every sense undergo reconstruction, and their relations to other psychic functions change, and new sensations, some of them very in-



GRANVILLE STANLEY HALL

tense, arise, and new associations in the sense sphere are formed. Haptic impressions, appetite for food and drink, and smell are most modified. The voice changes, vascular instability, blushing, and flushing are increased. Sex asserts its mastery in field after field, and works its havoc in the form of secret vice, debauch, disease, and enfeebled heredity, cadences the soul to both its normal and abnormal rhythms, and sends many thousand youth a year to quacks, because neither parents, teachers, preachers, or physicians know how to deal with its problems. Thus the foundations of domestic, social, and religious life are oftenest undermined. Between religion and love God and nature have wrought an indissoluble bond so that neither can attain normality without that of the other. Secondary sexual qualities are shown to have an ever-widening range, and parenthood to mean more with every upward step of development. The youth craves more knowledge of body and mind, that can help against besetting temptations, aid in the choice of a profession, and if his intellect is normal he does not vex his soul overmuch about the logical character of the universe or the

The introduction to the Special Theory of Relativity

in which

ALBERT EINSTEIN

added time to the three dimensions
of space and solved problems of
moving bodies, is next week's

150TH CLASSIC OF SCIENCE

ultimate sanction of either truth or virtue. He is more objective than subjective, and only if his lust to know nature and life is starved does his mind trouble him by in-growing. There are new repulsions felt toward home and school, and truancy and runaways abound.

The social instincts undergo sudden unfoldment and the new life of love awakens. It is the age of sentiment and of religion, of rapid fluctuation of mood, and the world seems strange and new. Interest in adult life and in vocations develops. Youth awakes to a new world and understands neither it nor himself. The whole future of life depends on how the new powers now given suddenly and in profusion are husbanded and directed. Character and personality are taking form, but every-

thing is plastic. Self-feeling and ambition are increased, and every trait and faculty is liable to exaggeration and excess. It is all a marvelous new birth, and those who believe that nothing is so worthy of love, reverence, and service as the body and soul of youth, and who hold that the best test of every human institution is how much it contributes to bring youth to the ever fullest possible development, may well review themselves and the civilization in which we live to see how far it satisfies this supreme test.

Never has youth been exposed to such dangers of both perversion and arrest as in our own land and day. Increasing urban life with its temptations, prematurities, sedentary occupations, and passive stimuli just when an active, objective life is most needed, early

emancipation and a lessening sense for both duty and discipline, the haste to know and do all befitting man's estate before its time, the mad rush for sudden wealth and the reckless fashions set by its gilded youth—all these lack some of the regulatives they still have in older lands with more conservative traditions. In a very pregnant psychological sense ours is an unhistoric land. Our very Constitution had a Minerva birth and was not the slow growth of precedent. Our ideas of freedom were at the outset fevered by the convulsion of the French Revolution. Our literature, customs, fashions, institutions, and legislation were inherited or copied, and our religion was not a gradual indigenous growth, but both its spirit and forms were imported ready-made from Holland, Rome, England, and Palestine. To this extent we are a fiat nation, and in a very significant sense we have had neither childhood nor youth, but have lost touch with these stages of life because we lack a normal development history. It is not merely that we have no antiquity rich in material and spiritual monuments that is the best nursery of patriotism in the young, but our gallery of heroes is largely composed, not of glorious youth but of sages advanced in age or old in wisdom for their years. Our immigrants have often passed the best years of youth or leave it behind when they reach our shores, and their memories of it are in other lands. No country is so precociously old for its years. Few as these are, the senescence of the original American stock is already seen in abandoned farms and the infecundity of graduates, so that if our population had been unreplenished from abroad for the last century we should be to-day not merely stationary, like France, but retrogressive. In this environment our young people leap rather than grow into maturity. Our storm and stress strenuousness too often imparts at least the narrow nervous intensity of an individuation that is biologically antagonistic to genesis and that is less ephebic, as we fondly think it to be, than ephebic. We are conquering nature, achieving a magnificent material civilization, leading the world in the applications though not in the creation of science, coming to lead in energy and intense industrial and other activities; our vast and complex business organization that has long since outgrown the comprehension of professional economists, absorbs ever more and earlier the best talent and muscle of youth and now dominates health, time, society,

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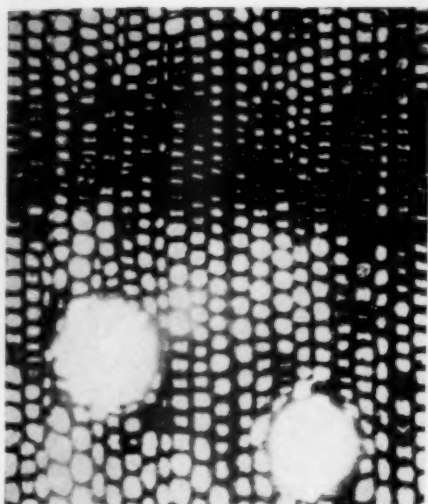
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SECTION OF PETRIFIED WOOD

Some millions of years ago, there stood in what is now Yellowstone National Park a tree something like a pine. *PITYOXYLON*, they call it now. It was felled and buried by a volcanic eruption, subsequently it became mineral-impregnated and petrified. Washed out ages later, a piece of its wood was sliced more than paper-thin by the U. S. National Museum, studied by Prof. H. S. Conard of Grinnell College, and photographed through the microscope by Cornelia Clarke. Details of its structure are so well preserved that they show up practically as clearly as do those of wood formed during the past season.

politics, and law-giving, and sets new and ever more pervading fashions in manners, morals, education, and religion; but we are progressively forgetting that for the complete apprenticeship to life, youth needs repose, leisure, art, legends, romance, idealization, and in a word humanism, if it is to enter the kingdom of man well equipped for man's highest work in the world. In education our very kindergartens, which outnumber those of any other land, by dogma and hyper-sophistication tend to exterminate the naïve that is the glory of childhood. Everywhere the mechanical and formal triumph over content and substance, the letter over the spirit, the intellect over morals, lesson setting and hearing over real teaching, the technical over the essential, information over education, marks over edification, and method over matter. We coquet with children's likes and dislikes and can not teach duty or the spirit of obedience. In no civilized land is teaching so unprofessional or school boards at such a low level of incompetence. Nowhere are the great traditions of the race so neglected, the high school so oblivious of either the nature or the needs, or both, of the adolescent stage

of life. The American college is half universitized with methods and matter prematurely specialized, and half bound to the recitation, marking methods and discipline of the school, while the apex of our educational system is still in Europe, where hundreds of our best graduates go yearly to find the advanced and special training we are still, in most departments, unable to supply.

In religion, which was grafted from an alien ethnic stock, we lack scientific sincerity. Statistics show more sects and more clergymen per capita of population than in any other land, and a rapidly progressive ignorance by the rising generation of the very Bible we profess to revere. Churches, charities, missions abound, but our slums are putrefying sores whose denizens anthropologists believe lower in the moral and intellectual scale than any known race of savages, and the percentages of juvenile crimes and the average age of first commitment grows steadily earlier. We have vastly simplified politics by separating Church and State and by our voluntary system, but we have also permitted a chasm to yawn between our secular and religious life, between science and theology, till even seminaries for the training of clergymen neglect and even suspect the study of nature as if God were a hypocrite and did one thing in His works and said another in His Word, when in fact each supplements and is an imperfect thing without the other. We try to impose not only our civilization, but our religion, upon lower races, even though they are thereby exterminated, and fail to study the nature and needs of even those we try to help.

All this is hard on youth, which was better understood in ancient Greece and Rome than now, for it is profoundly responsive to all these influences. Despite all this I am an optimist root and core, not merely because an evolutionist must hold that the best and not the worst will survive and prevail, but because in most, though not yet in all, of these fields I see clearly the beginnings of better things. Even in education and religion, the strongholds of conservatism, there are new and better ideals and efforts, and these are less exceptional and are growing in power and influence and are represented by more and better men. In vigor, enthusiasm, and courage we are still young, and our faults are those of youth. Because they have been great our suffering has been also great, and pain is the world's best teacher whose lessons are surest to be

laid to heart. The very fact that we think we are young will make the faith in our future curative, and we shall one day not only attract the youth of the world by our unequaled liberty and opportunity, but develop a mental, moral, and emotional nurture that will be the best preparation for making the most and the best of them and for helping humanity on to a higher stage.

Science News Letter, February 7, 1931

SEISMOLOGY

Fatal Earthquake Rocks A Land of Quakes

NEW ZEALAND'S destructive earthquake of Monday, Feb. 2, adds another chapter to the island Commonwealth's already notable history as a country where such things are likely to happen. Relatively new, in a geological sense, its mountain young and still growing, it resembles Japan, California, and other lands that lie in a great circle around the Pacific in the uneasiness of its underlying rock strata.

North Island was visited by this week's quake. Two years ago, on June 17, 1929, it was South Island's turn. In the neighborhood of the town of Murchison the earth humped itself up and stayed up, causing great damage to the railroad tracks which traversed the area. The maximum height of the new-made elevation was measured at fourteen feet nine inches.

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NUTRITION

New Method for Producing Vitamin D in Food

NEW WAYS of preserving food, enhancing its bone-building vitamin content and retaining fresh flavor and odor through the use of invisible light have been discovered. The discovery and its development to the point of commercial application is due to Prof. George Sperti and his associates of the basic science research laboratory of the University of Cincinnati.

Narrow bands in the "rainbow" of invisible light or ultraviolet radiation were found to produce these beneficial effects upon food products. By exposing milk and other foods to these special wavelengths of ultraviolet radiation, it was found possible to produce the artificial antirachitic vitamin D without an offensive taste and smell in the food. In this respect the new discovery is claimed to be an improvement on the previous methods of activating foods that have been in use commercially for several years.

Foods treated with ultraviolet light act in all ways as if they contain Vitamin D, which prevents rickets. By using only a part of the total ultraviolet band of light waves, Professor Sperti, the director of the laboratory, has been able to produce much larger quantities of the vitamin. He avoided also the simultaneous destruction of the active substance by other constituents of the ultraviolet region, which occurs with the older method.

Filtered ultraviolet radiation promises to be effective in preserving food products as well as in increasing the vitamin D content. Professor Sperti and his associates found it possible to sterilize milk, orange juice and other food products by exposing them to narrow spectral limits of the invisible ultraviolet light.

The method depends on the existence of a critical wave-length at which biological reactions begin and applies to all kind of radiations. A given effect occurs with shorter wave-lengths, that contain larger quanta of energy, but longer wave-lengths than the critical one are inactive.

If yeast used in making bread is irradiated with a narrow frequency band of X-rays, unwanted mold cells that would spoil the bread after baking are killed, while the yeast cells are unharmed.

Science News Letter, February 7, 1931

BOTANY

Nature Ramblings

By FRANK THONE



Scrub Pine

WHEN this country was being settled, there was cast ahead of the first wave of really permanent settlers a restless, poverty-bitten, migrant class of people called "movers." They never held a farm for as much as a decade, but as soon as they heard another family had moved into the next township they decided the country was "gittin' too crowded," and so sold out to the first bidder.

Of such a generation of semi-Ishmaelites are the numerous species of scrub pine to be found in all parts of the world. They are always among the first trees to arrive on a newly exposed terrain, laid bare by a fire, or the moving of a sand dune, or the raising of land from below an old tide level, or left as a mountain-side scar by an avalanche. They are "pore an' no-account" but they are tough and very patient, and they can eke out a living from a spoonful of dust in the cracks of a rock, or from the miserly nutriment offered by a heap of raw, drifting sand.

But neighbors they cannot abide. And when the more prosperous tree species begin to arrive—their settlement more often than not made possible by the soil-forming processes carried on under the shelter of the despised scrubs—the bent and knotted first-comers yield their birthright, and leave their land to the children of strangers. Their own offspring may be found again at the raw frontier pushing out into the most hopeless places, and taming them a little, to make possible a still farther advance of the trees that will surely come again to drive them out.

Science News Letter, February 7, 1931

China has had at least one famine each year for the past two thousand years.

• First Glances at New Books

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Astronomy

THE MYSTERIOUS UNIVERSE—Sir James Jeans—*Macmillan*, 163 p., \$2.25. The publication of a new book by Sir James automatically causes a person who is interested in the latest literature in astronomy to rush to his book store to purchase a copy. This work is fully up to the expectations aroused by the name of the author. "From the intrinsic evidence of his creation," he says, "the great Architect of the universe now begins to appear as a pure mathematician," thus recalling the aphorism attributed to Pythagoras, that "God always geometrizes."

Science News Letter, February 7, 1931

Sociology-City Planning

POSTWAR PROGRESS IN CHILD WELFARE—Edited by J. Prentice Murphy and James H. S. Bossard—*American Academy of Political and Social Science*, 315 p., \$2. A symposium by prominent specialists on various sociological, psychological, and health problems connected with the care and proper upbringing of children. A supplement discusses "Airport Problems of American Cities." One of the *Annals of the Academy*.

Science News Letter, February 7, 1931

Invention

INVENTION AND SOCIETY—Waldemar Kaempffert—*American Library Association*, 38 p., 35c. This pamphlet, No. 36 of the *Reading With a Purpose* series, is interesting in itself and serves as an introduction to further reading in six recommended books on invention.

Science News Letter, February 7, 1931

Physics

THIS PHYSICAL WORLD—Janet Polak—*Rockwell*, 112 p., \$1.25. An interesting little book for children that presents simply and clearly some of the elementary facts of physics.

Science News Letter, February 7, 1931

Marine Zoology

SCIENTIFIC RESULTS OF THE CRUISES OF THE YACHTS "EAGLE" AND "ARA", 1921-1928, WILLIAM K. VANDERBILT, COMMANDING—Lee Boone—*Privately printed, Huntington, L. I., N. Y.*, Vol. II, 228 p., 74 pl.; Vol. III, 221 p., 83 pl., \$10 each volume. Mr. Vanderbilt is playing in this country, in some measure, the rôle carried with such great distinction in Europe by the late Prince of Monaco. The present pub-

lications of the collections of crustacea made on a considerable series of cruises will be welcomed by systematic students in their particular field.

Science News Letter, February 7, 1931

Forestry-Administration

THE FOREST SERVICE: ITS HISTORY, ACTIVITIES AND ORGANIZATION—D. H. Smith—*Brookings Institution*, 268 p., \$2. An addition to the very useful series, *Service Monographs of the U. S. Government*, issued by the Institute for Government Research. It gives in great detail the basic information concerning this very important bureau of the U. S. Department of Agriculture, telling of the distribution of the personnel from Chief Forester down to messenger, relates the manifold duties this scientific and administrative army has to perform, and collates the laws under which it acts. One of the most useful sections of the book will be the extensive bibliography.

Science News Letter, February 7, 1931

Biography-Natural History

MEMOIRS OF TRAVEL, SPORT AND NATURAL HISTORY—Henry John Elwes—*Benn*, 317 p., 21 s. The late Mr. Elwes, one of the best known of British travelers and sportsmen, was also an amateur scientist in the ancient and true sense of the word. He has left us in this book a fascinating record of much of his active life.

Science News Letter, February 7, 1931

Aviation

FLYING FROM THE GROUND UP—R. Sidney Bowen, Jr.—*Whittlesey House*, 234 p., \$2. Good reading for those about to learn to fly. It is easy reading, too, and it may give you a hankering to pilot your own ship if you are not that way already.

Science News Letter, February 7, 1931

History

MISSISSIPPI HISTORY—Charles S. Syndor and Claude Bennett—*Rand McNally*, 378 p., \$1. A textbook intended for sixth and seventh grade pupils of the state.

Science News Letter, February 7, 1931

Zoology

OPINIONS RENDERED BY THE INTERNATIONAL COMMISSION ON ZOOLOGICAL NOMENCLATURE: OPINIONS 115 TO 123—*Smithsonian Institution*, 36 p. Of interest to systematists.

Science News Letter, February 7, 1931

Archaeology

THE ARCHAEOLOGY OF ROMAN BRITAIN—R. G. Collingwood—*Lincoln MacVeagh*, 293 p., \$6. Roman forts in Britain, Roman roads, villas and temples and coins possessed by the people of Roman Britain, such matters of historic interest are described, chapter by chapter, in this handbook. The author aims, successfully, at two targets: simplicity, so as not to dismay the beginner; and a coverage of the subject that will be useful to the student and specialist. It is a book of facts, from beginning to end, and when the end is reached Roman Britain has been thoroughly and specifically accounted for. The volume is one of the series, *The Illustrated Library of Archaeology*.

Science News Letter, February 7, 1931

Logic

THE PRINCIPLES OF REASONING—Daniel Sommer Robinson—*Appleton*, 393 p., \$2.50. The second edition of a textbook on formal logic. Parts of the book are entirely rewritten, and new material has been added to keep it abreast of the times. An interesting section includes a discussion of the relation to logical concepts of the theories of Gestalt psychology.

Science News Letter, February 7, 1931

General Science-Education

DOCTORATES CONFERRED IN THE SCIENCES BY AMERICAN UNIVERSITIES—Callie Hull and Clarence J. West—*National Research Council*, 49 p., 50c. The number of Ph.D.'s produced in America has steadily increased from 350 in 1920 to 1,055 in 1930. The 1930 recipients and their thesis subjects are given in this bulletin.

Science News Letter, February 7, 1931

Ethnology

THE HALF-WAY SUN—R. F. Barton—*Brewer and Warren*, 315 p., \$5. The author went to the Philippines as a teacher, but he was eager to learn as well as to impart instruction and he here gives us the benefit of his intimate acquaintance with the little-known head-hunting natives of those islands.

Science News Letter, February 7, 1931

Aviation

BEGINNER'S BOOK OF MODEL AIRPLANES—Carl H. Claudy—*Bobbs Merrill*, 184 p., \$1.75. A book for the boy who has just acquired the wholesome desire to build an airplane.

Science News Letter, February 7, 1931

• First Glances at New Books

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General Science

CARNEGIE INSTITUTION OF WASHINGTON YEARBOOK NO. 29 (1930)—*Carnegie Institution of Washington*, 454 p., pa. \$1, cl. \$1.50. This annual report of the activities of the various departments of the Carnegie Institution contains an impressive record of accomplishment in many fields of science, by workers scattered all over the United States and through the whole world. Their interests range from the secret depths of the earth to the immeasurable spaces between the stars, from the obscure forces at the beginnings of life to the records of the highest social and artistic strivings of the human mind.

Science News Letter, February 7, 1931

Museums

REPORT OF THE UNITED STATES NATIONAL MUSEUM FOR THE YEAR ENDED JUNE 30, 1930—*Government Printing Office*, 219 p., 35c. Curators of the National Museum tell of progress and accessions in their various departments during the past year.

Science News Letter, February 7, 1931

Anthropology

CHILDREN WHO RUN ON ALL FOURS—Ales Hrdlička—*McGraw-Hill*, 418 p., \$5. Does your baby walk like a bear? This atavism, running on hands and feet instead of creeping on hands and knees, is more common than one might imagine. Dr. Hrdlička has collected records of some hundreds of cases, many of which were sent in as the result of a Science Service article published in the SCIENCE NEWS-LETTER and elsewhere, and in this book correlates and compares data on this phenomenon for the first time. He also adds records of many other interesting "throw-back" behaviors.

Science News Letter, February 7, 1931

Engineering

WATER HEATING—*American Gas Association*, 130 p., \$3. Economic and engineering aspects of the use of gas in water heating for large and small users.

Science News Letter, February 7, 1931

Standards

A. S. T. M. STANDARDS—*American Society for Testing Materials*, 2 Vol., 1,000 p. and 1,214 p., \$14. Every third year the A. S. T. M. issues its standards in two volumes, one devoted to metals and the other to non-metals. They have become the basis for the

purchase and use of engineering and industrial materials throughout the nation. For engineers, architects, chemists, and others who buy and use metallic and non-metallic materials, they are of fundamental reference value.

Science News Letter, February 7, 1931

Tropical Medicine and Biology

THE AFRICAN REPUBLIC OF LIBERIA AND THE BELGIAN CONGO—Edited by Richard P. Strong—*Harvard University Press*, 1,064 p., \$15. Here is a wealth of information about the country that is now the subject of diplomatic negotiations and of much popular comment. The second and third parts of this two-volume report are technical, dealing with medical, pathological and biological investigations in both Liberia and the Belgian Congo, and will consequently be of interest chiefly to students of these sciences. Part one, however, is concerned with conditions in Liberia itself and is sufficiently general and non-technical to interest the lay reader. The report is based on observations made and material collected by the Harvard African Expedition of 1926-1927. The interest of the text is considerably enhanced by the many excellent illustrations.

Science News Letter, February 7, 1931

Biography

PAUL DU CHAILLU, GORILLA HUNTER—Michel Vaucaire, transl. by Emily Pepper Watts—*Harpers*, 322 p., \$4. A biography of the astonishing little French-American who first convinced the world of the existence of the biggest of the apes, well written by a Frenchman and well translated by an American woman.

Science News Letter, February 7, 1931

General Science—Philosophy

MAN AND HIS UNIVERSE—John Langdon-Davies—*Harper & Brothers*, 341 p., \$5. A readable account of the change in popular beliefs originating in science, from the middle ages onward. The scholarly background of the book is, however, considerably over-blurred by the publishers.

Science News Letter, February 7, 1931

Biology

A TEXT-BOOK OF BIOLOGY—W. M. Smallwood—*Lea & Febiger*, 469 p., \$4. The sixth edition, re-written and revised, of a standard text for general, medical and technical students.

Science News Letter, February 7, 1931

Psychology

THE PSYCHOLOGY OF ACHIEVEMENT—Walter R. Pitkin—*Simon and Schuster*, 502 p., \$3.50. You will probably be entertained by reading this book and its discussions of why a variety of men from Babe Ruth to Thomas Carlyle became what they are or were. Appended to the book are a series of impressive-looking charts on which you can diagram your own traits. Popularly presented, but not a weighty contribution to human knowledge.

Science News Letter, February 7, 1931

General Science

EXPLORATORY SCIENCE SERIES: PLANT AND ANIMAL NEIGHBORS—F. B. Younger, 229 p.; OUR FOOD SUPPLY—A. G. Oosterhous, 252 p.; OUR FORESTS, A NATIONAL PROBLEM—B. J. Rohan, 189 p.; OUR EARTH AND ITS NEIGHBORS—Irma Roemer, 119 p.—C. C. Nelson, \$1 each. We have here a most interesting venture in science book production for secondary schools. All four books in this series were written by members of the faculty of Wilson Junior High School of Appleton, Wis., and published in the same city, under the editorship of Prof. C. O. Davis of the University of Michigan. This collaboration in authorship in one place makes for uniformity in approach to the teaching problems involved, a very desirable thing from the school man's point of view.

Science News Letter, February 7, 1931

Penology-Architecture

PRISONS AND PRISON BUILDING—Alfred Hopkins—*Architectural Book Publishing Co.*, 140 p., \$5. The architect who designs prison buildings must plan a structure adaptable for present methods of treatment of offenders and also for tomorrow's new ways. Does the prison need a wall—where should showers be placed—how is ventilation to be accomplished? The author answers many such questions of interest to anyone who has to do with the housing of prisoners.

Science News Letter, February 7, 1931

Aviation

AIR TRAVEL—James E. Mooney—*Scribners*, 303 p., \$1. A history and explanation of aviation written for boys and girls. Suggestions for the organizations on model aircraft clubs are included.

Science News Letter, February 7, 1931